

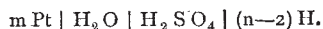
either by the positive metal alone or by the two metals in conjunction, without the presence of another body ready to combine with one of its elements when let free.

Grove's gas battery is essentially different from this, if the oxygen and hydrogen condensed on the platinum plates play the part of the two metals; but it closely resembles this if hydrogen acts the part of the positive metal, and platinum that of the negative; the dilute sulphuric acid will then be decomposed on account of the simultaneous presence of the oxygen which can combine with the liberated hydrogen. Viewed in this manner, Grove's gas-battery is only a special case of the reaction mentioned in the communication to the Royal Society, and the formulæ will be—

Before contact—



After contact—



The practical interest of this arrangement lies in the fact that it is an approximation towards a constant air-battery. Should it ever come into use it would, of course, not be in the form described in this paper, but probably in a combination of copper and zinc, with an aerated solution of zinc chloride, which has an electro-motive force six times that of the silver-copper cell, and three quarters that of a Daniell's cell. Chloride of zinc is preferable to the sulphate, as it offers less internal resistance, and a solution of 20 per cent. is about the best conductor. A single cell of this kind decomposes dilute sulphuric or hydrochloric acid, with copper electrodes.

The power is thus obtained at a minimum of expense, for the oxygen which combines with the zinc costs nothing.

Such a battery would appear to be specially applicable to cases where the galvanic current has to be frequently broken, as in telegraphy, for, at each period of rest, it renews its strength by the absorption or diffusion of more oxygen from the surrounding air.

SCIENTIFIC SERIALS

Zeitschrift für Ethnologie.—The second number of this journal for 1872 scarcely possesses the same scientific value as former numbers. We have, first, the concluding part of Dr. E. von Martens' lecture, read before the Anthropological Society of Berlin, December 1871, on the different uses of the Conchylia. The paper is characterised by true Germanic exhaustiveness, but it indicates a want of appreciation on the part of the author of the relative value of authorities, ambiguous allusions in Longfellow's "Hiawatha" being adduced as evidence, side by side with the statements of scientific travellers. Dr. Martens passes in review every use to which shells have been put in ancient or modern times, and in civilised or uncivilised countries.—Dr. Robert Hartmann continues his notice of the remains found in the Lake Dwellings of Switzerland, and draws attention to the absence of the domestic cat from the more ancient fauna of Europe. The most numerous animal remains belong to the common European stag (*Cervus elephas*), but are of colossal size, and so nearly akin to *Cervus Canadensis* as to raise the question whether the *C. elephas* of the Swiss Lake deposits may not be identical with *C. canadensis*. No trace of reindeer has been discovered, although that animal was common in Switzerland during the glacial period.

In the third number (1872) of the journal, we have an interesting report of the remains of pile dwellings in the Archipelago of North Celebes, which have been examined by the Dutch "Assistant Resident," J. G. F. Riedel. The paper is illustrated with drawings of these huts, and of the different types of head most commonly observed among the North Celebes tribes in the present day. It would appear that the Aborigines were not lake-dwellers. The Toun Singals, however, who were of foreign origin, and arrived in the country between the 12th and 13th centuries, although they at first dwelt on the strand of the present Negeri Atep, soon left their original settlements, and built themselves pile-huts on the great Minahasa Lake, where they were secure from the pursuit of the robber tribes of Djailolo, whose incessant attacks had been the chief incentive to their immigration. The remains of these lake-dwellings give evidence of their solidity, for Herr Riedel found that the piles were for the most part 3 ft. in diameter, and 20 ft. in height above the surface of the lake; the length of each hut was nearly

70 ft., and the breadth 40 ft. Among other events the enforced conversion to Christianity of the Toun Singals in 1830 has separated them still more from the habits of their race, and the memory of the older pile-dwellings seems to be fast dying out among them.

Dr. Bastian gives us in the third number a very complete and carefully elaborated paper on Comparative Philology. He begins by treating of the physiological formation of speech; and of the widely differing groups of emotions which respectively find expression in vocals and in consonants. He passes in review the various nations, whose original language exhibits a preponderance of either of these distinctive characters. Among the older races of America and Africa consonants largely predominate, while in the Malay Polynesian dialects vocal sounds are strongly in the ascendant. The phonetic character of a language influences its grammatical peculiarities.

Herr Rade, who has spent eight years in endeavouring to discover among the Kaukasian tribes some fixed type of their nation, finds from his prolonged investigation of living and dead skulls that the mingling of races has been so continuous in these regions, that it is impossible any longer to recognise the "Kaukasian Race" as it was defined by Blumenbach. Herr Rade has hitherto failed in detecting certain evidence of the existence of Lacustrine dwellings in any of the Kaukasian lakes which he examined.

Dr. Virchow, at a recent special meeting of the Anthropological Society of Berlin, read an interesting paper on the results of a series of explorations made by himself and his sons in the course of last year in the little island of Wollin, lying off Pomerania, in the Baltic. Wollin or Julin as the locality in which the sea-kings or Vikingar had established their once formidable republican settlement of Jomsburg, has always presented special features of interest for Northern inquirers and historians. The early chroniclers of Northern Germany and Scandinavia make frequent allusion to the enormous wealth and great importance of the trading ports of this small island. After ages of decay and desertion the island is again acquiring some slight amount of recognition through the recent establishment of baths near the little town of Wollin. It is here that Dr. Virchow and his sons found unmistakeable evidences of the early existence of a large and wide-spread population. Near the little lake of Vietzig, under a surface of loam or clay-mud, Dr. Virchow came upon a bed of *débris* from 4 to 7 ft. in depth, which was entirely formed of fish and animal bones, broken vessels, and all the ordinary adjuncts of the Kjökkenmøddinge as they have been revealed in the Lacustrine deposits of Pomerania. At some places where the hills have been cut, the exposed surfaces seem composed almost entirely of the scales and bones of fishes and other animal remains. At one spot, on the S.E. of the present town, a burying ground was discovered, on which 60 grave-hillocks could still be counted. On penetrating below the surface a heap of burnt and fractured bones was found at a depth of 18 to 20 in., but in no grave, explored by Dr. Virchow, was any trace of urn, stones, or textile fragment to be seen; although remains of fused bronze were met with. A small grant of money has been made by the Society for the purpose of continuing the exploration of the island, and if the work should be placed under the direction of Dr. Virchow we may anticipate valuable results from a more systematic investigation of this site of the most formidable piratical republic ever founded in Northern Europe.

In a paper laid before the Société d'Anthropologie de Paris by M. Broca, on the Toulouse form of narrow or flat-head deformities, the author enters at length into the consideration of the probable effect on the cerebral functions produced by the ligatures, with which the peasant mothers of some parts of south-west France still compress their children's heads.

THE *Zoologist* for April, after a reprint from the *American Naturalist* of Prof. N. S. Sha'er's paper, "Notes on the Right and Sperm Whales;" and ornithological notes from Lincoln-hire and Devon, enters further into the discussion of Dr. Baldamus' theory as regards the cuckoos' egg. Mr. Hewitson replies sharply to Mr. Smith's paper in the preceding number; Mr. G. D. Rowley opposes the theory, and thinks that "birds are only too glad to sit on cuckoos' eggs," as they will sit on nothing rather than not incubate. Mr. Doubleday writes to the same effect, as does also Prof. Newton in a quotation from the *Field*. Mr. Smith acknowledges that in writing his former letter, he had not seen Prof. Newton's article on the subject in NATURE (vol. iii. Nov. 1869), but still maintains that British

ornithologists have not yet investigated the question "in the systematic way, and after the excellent example of painstaking and diligence set us by Dr. Baldamus and Dr. Rey." The editor, referring to a note on the Librarian Hippopotamus which appeared in this periodical a month ago, states that the author has made a mistake in calling it a true hippopotamus. The context clearly shows how the term is meant, and it is an undoubted fact that the English name has a wider meaning than its Latin equivalent. Chœropsis is as true a hippopotamus as Rhinaster or Ceratorhinus are true rhinoceroses, and they are so undoubtedly in the English acceptance of the words, so we think Mr. Newman too ready in discovering errors.

The *Canadian Naturalist and Quarterly Journal of Science*, vol. vii. No. 1.—The first paper in this number is one which we have already received in a separate form, viz. Principal Dawson's Address as President of the Natural History Society of Montreal. He discusses, (1) The present aspect of inquiries as to the introduction of genera and species in geological time. (2) The growth of our knowledge of the Primordial and Laurentian rocks and their fossils. (3) The questions relating to the so-called glacial period. This is followed by a paper on Some Results of the last Solar Eclipse, in which the author, Mr. G. F. Armstrong, sums up briefly the results which have been obtained from the eclipses of 1865 and succeeding years. In a paper on Cuba Mr. G. F. Matthew makes some contributions to our knowledge of the natural history of that island. There is a geological paper on Huron County, Ontario, and another on the Mineral Region of Lake Ontario. The last paper in the journal is the obituary notice of the late Prof. Sedgwick, which appeared in NATURE.

SOCIETIES AND ACADEMIES

LONDON

Geologists' Association, April 4.—Professor Morris, F.G.S., vice-president, in the chair.—"On the Diamond Fields of South Africa," by Mr. G. C. Cooper.—The theory of an igneous action upon the spot at which the diamonds are now found being the explanation required to solve the problem of their origin was opposed by the author, who adduced facts from his observation in support of the opposite conclusion. He did not consider that the numerous trap dykes which characterise the South African Diamond Fields broke through the present surface, which, on the contrary, had been produced by the accumulation of materials brought by aqueous agency subsequent to the volcanic action which gave rise to the dykes. These materials consisted of a surface layer of red sand overlying a bed, from five to seven feet thick, of fragments of "lime and clay stone;" and beneath this the diamantiferous marl or "stuff" is reached. Steatitic or magnesian matter forms a considerable proportion of the "stuff" which it was contended may have been brought from magnesian rocks at a considerable distance by water and possibly by ice action, and deposited in the hollows formed by the trap dykes, and that these magnesian rocks may have been the original matrix of the diamonds.—"On some Fossils from the Chalk of Margate," by J. W. Wetherell. The author had devoted some time and attention to the exploration of the chalk in the immediate neighbourhood of Margate, and had obtained, as a result, a large number of species of fossils, a list of which was given, with remarks as to relative abundance. In addition to many genera usually abundant in the Upper Chalk, *Belemnitella* appears to be well represented in the Margate chalk, and ammonites are also found; but perhaps the most abundant fossil is the *Coscinopora globularis*, which varies in size from that of a walnut to a pin's head. Crystals of selenite were found as well as concretions of iron pyrites, but minerals are by no means common in the chalk of Margate.

Mathematical Society, April 10.—Dr. Hirst, F.R.S., president, in the chair.—Prof. Clifford made a few remarks in correction of a statement he had made at the March meeting during the discussion on Mr. Hayward's paper on an extension of the term *area*.—Mr. J. W. L. Glaisher then proceeded to read a paper on the calculation of the value of the theoretical unit angle to a great number of decimal places.—The following papers (in the absence of the authors) were discussed by Messrs. Clifford, Cotterill, Merrifield, and the president:—On systems of porismatic equations, algebraical and trigonometrical; Note on epicycloids and hypocy-

cloids; Locus of point of concurrence of perpendicular tangents to a cardioid; Elliptic motion under acceleration constant in direction; Prof. Wolstenholme, on the theory of a system of electrified conductors; On the focal lines of a refracted pencil, Prof. J. Clerk-Maxwell.

Royal Horticultural Society, March 26.—Special general meeting, Lord Alfred Churchill in the chair.—The business practically consisted in the consideration of two bye-laws proposed by the Council. The first, giving to all the fellows the right of vote by proxy (hitherto restricted to ladies), was rejected. The second, empowering the fellows to elect to vacancies on the Council at a general meeting other than the annual general meeting, if more than half their number resign at any one time, was carried. Great excitement and disorder was manifested throughout the prolonged discussions.

April 2.—General Meeting, Mr. W. Saunders, F.R.S., in the chair.—A communication was read from Mr. Cocks, on budding vines. It was shown (1) that the extirpation of all the buds of the budded plant gave the inserted buds a better chance of success by removing competition, and (2) that there was no advantage in inserting new buds in the seats of those removed.

Scientific Committee, Dr. J. D. Hooker, C.B., F.R.S., in the chair.—Mr. Smee exhibited lemons infested with *Coccus limonii*, which caused the green colour of the unripe fruit to persist round the points of attachment, and injured the lemons for preserving purposes.—The Rev. M. J. Berkeley stated that the new potato disease described by Hallier in his "Parasitenkunde," was no doubt identical with the "copper-web" of the asparagus-growers of the Isle of Ely. It had been described as *Rhizoctonia*.—Dr. Hooker read a portion of a letter from Mr. Woodrow, stating that a succulent composite, *Notonia grandiflora*, had a great reputation as a cure for hydrophobia in the neighbourhood of Bombay.—Prof. Thiselton Dyer pointed out that the seeds of the Sooly Qua were not identical with those of *Luffa acutangula*; they much more resembled those of *Luffa aegyptiaca*.

April 6.—Special general meeting, Lord Alfred Churchill in the chair.—The following new members of Council were elected on the proposition of Lord Strathmore.—Viscount Bury, M.P., Hon. R. Chetwynd, Mr. Hardcastle, M.P., Sir C. Lindsay, Mr. W. A. Lindsay (Secretary), Sir A. Slade, Mr. Hellock, Mr. A. Smee, Mr. H. Little, Mr. R. Warner.

Institution of Civil Engineers, April 8.—Mr. T. Hawksley, president, in the chair. The paper read was "On the Rise and Progress of Steam Locomotion on Common Roads," by Mr. John Head, Assoc. Inst. C.E., and was divided into four parts:—1. Road locomotives for conveyance of passengers, also locomotives for use on tramways. 2. Road locomotives for conveyance of goods, heavy weights, &c., also steam road rollers. 3. Locomotives for use in agricultural operations, steam ploughing, &c. 4. Locomotives for military purposes.

Cambridge Philosophical Society, March 3.—Notes on the Hippopotamus, by Mr. J. W. Clark. The author exhibited the mounted skeleton, and some portions of the visceral anatomy, of the female hippopotamus which died in the London Zoological Gardens in January 1872, and made some remarks on the specimens.—"On the Foraminifera and Sponges of the Cambridge Upper Greensand," by Mr. W. J. Sollas. The author described the green grains abundant in the formation, and showed that, like those in many other rocks, they were to a large extent the casts of foraminifera. He then discussed the formation of the so-called coprolites, and showed that in a great number of instances these nodules were phosphatised sponges, just as the flints of the chalk were silicified sponges. He thought that the phosphate of lime might have been derived from the erosion of volcanic rocks in the south of Scotland which had been brought by a current from the north.—"On a Boulder in a coal seam, South Staffordshire," by Mr. Bonney. This boulder, found in the black coal of the Cannock and Rugeley Colliery, a seam nearly 3 yards thick, weighed 13 lbs. 13½ oz., was about 19 in. in girth either way, and about 4½ in. thick, it was of a compact grey quartzite, apparently identical with one of the rarities in the Bunter conglomerates of the district. He considered that the boulder, which was quite solitary, had been brought to its present position (probably during a flood) entangled in the roots of a tree—and discussed the bearings of its occurrence upon the physical geography of England in the carboniferous and triassic times.